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 TI Vitreoscilla hemoglobin - Intracellular localization and binding to membranes
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 ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
 AB The obligate aerobic bacterium, *Vitreoscilla*, synthesizes elevated quantities of a homodimeric hemoglobin (VHb) under hypoxic growth conditions. Expression of VHb in heterologous hosts often enhances growth and product formation. A role in facilitating oxygen transfer to the respiratory membranes is one explanation of its cellular function. Immunogold labeling of VHb in both *Vitreoscilla* and recombinant *Escherichia coli* bearing the VHb gene clearly indicated that VHb has a cytoplasmic (not periplasmic) localization and is concentrated near the periphery of the cytosolic face of the cell membrane. *OmpA signal*-peptide VHb fusions were transported into the periplasm in *E. coli*, but this did not confer any additional growth advantage. The interaction of VHb with respiratory membranes was also studied. The K_d values for the binding of VHb to *Vitreoscilla* and *E. coli* cell membranes were similar to 5-6 μ M, a 4-8-fold higher affinity than those of horse myoglobin and hemoglobin for these same membranes. VHb stimulated the ubiquinol-1 oxidase activity of inverted *Vitreoscilla* membranes by 68%. The inclusion of *Vitreoscilla* cytochrome *bo* in proteoliposomes led to 2.4- and 8-fold increases in VHb binding affinity and binding site number, respectively, relative to control liposomes, suggesting a direct interaction between VHb and cytochrome *bo*.
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 STP KeyWords Plus (R): RECOMBINANT *ESCHERICHIA-COLI*; DIMERIC BACTERIAL HEMOGLOBIN; GLOBIN GENE; PRIMARY SEQUENCE; OXYGEN; EXPRESSION; FLAVOHEMOGLOBIN; CYTOCHROME; IMPROVES; CLONING

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